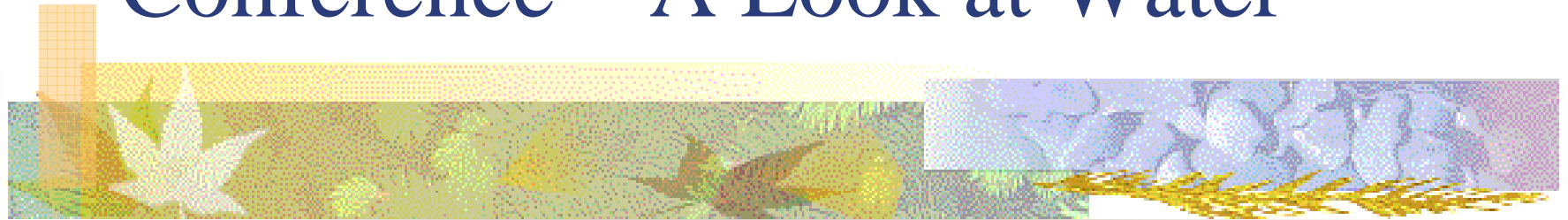


Greening State Government Conference – A Look at Water



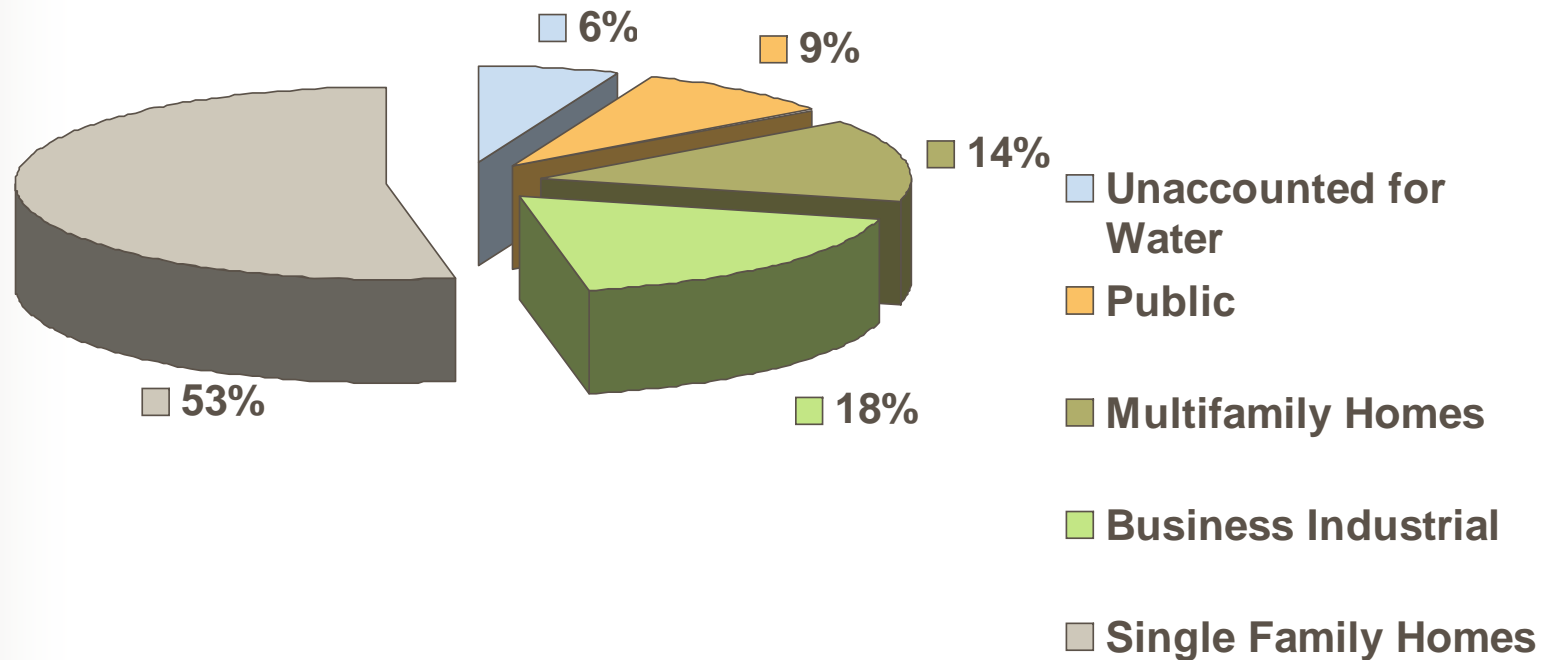
You Can Make a Difference



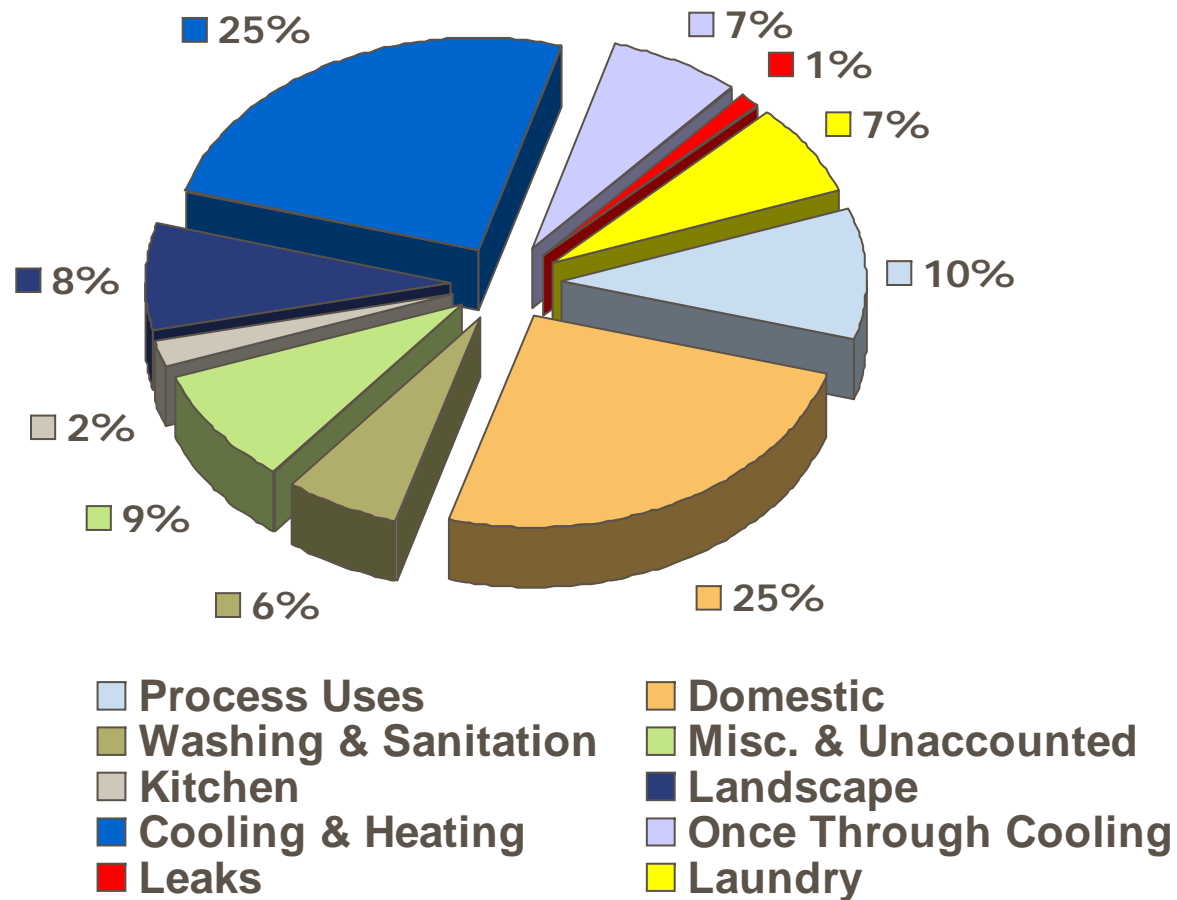
Overview of Denver Water

- Population Served – 1,100,000
- Population – 50% Inside Denver
50% Suburbs
- 50% of Supply from East Slope
50% of Supply from West Slope
- Independent Agency of City & County of Denver

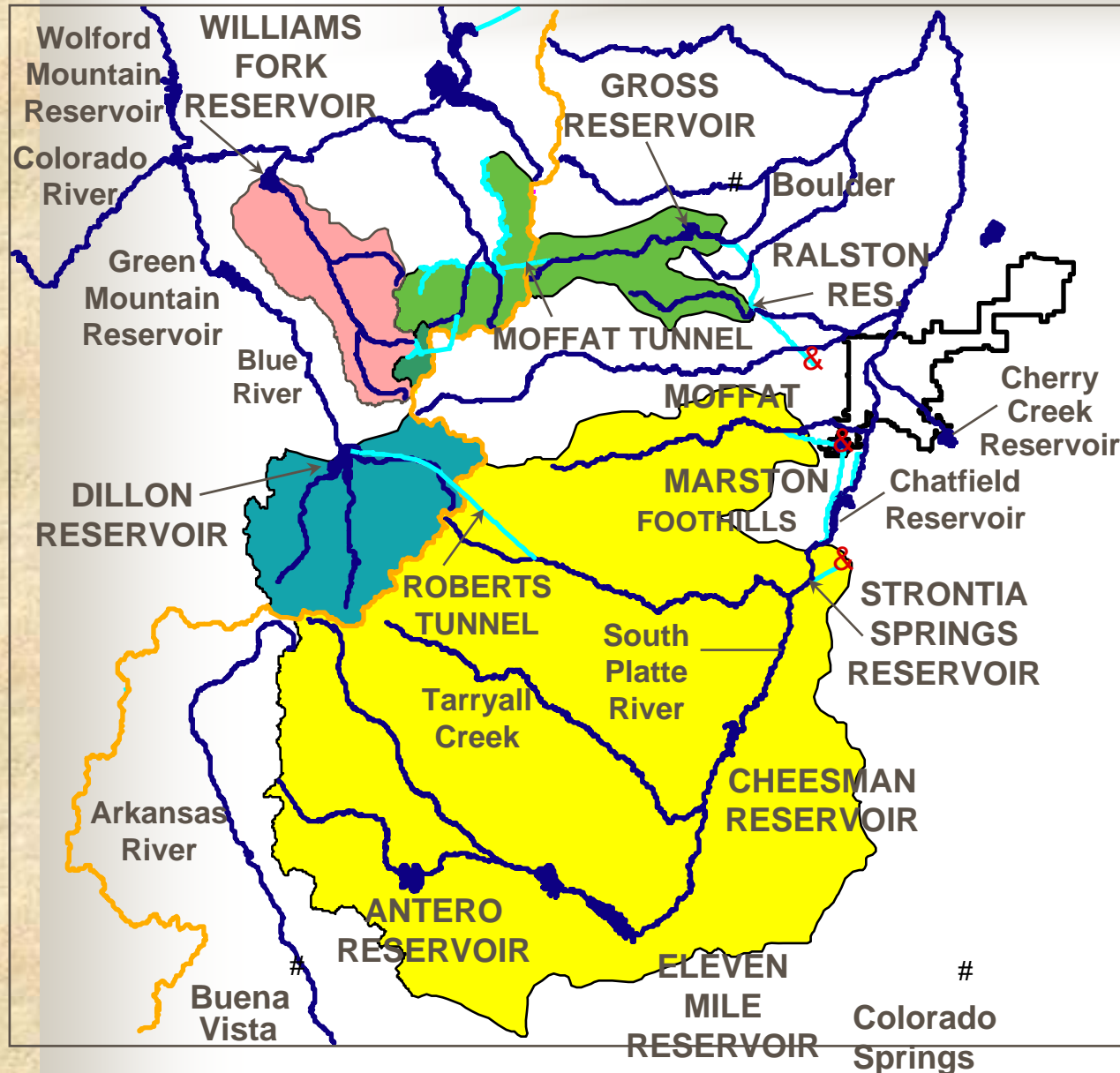
Customer Use by Category



Commercial/Industrial/Public Uses



Denver Board of Water Commissioners Water Collection System



COLLECTION SYSTEMS

SOUTH
PLATTE

MOFFAT
TUNNEL

ROBERTS
TUNNEL

WILLIAMS
FORK
WATERSHED



TREATMENT
PLANT



CONTINENTAL
DIVIDE



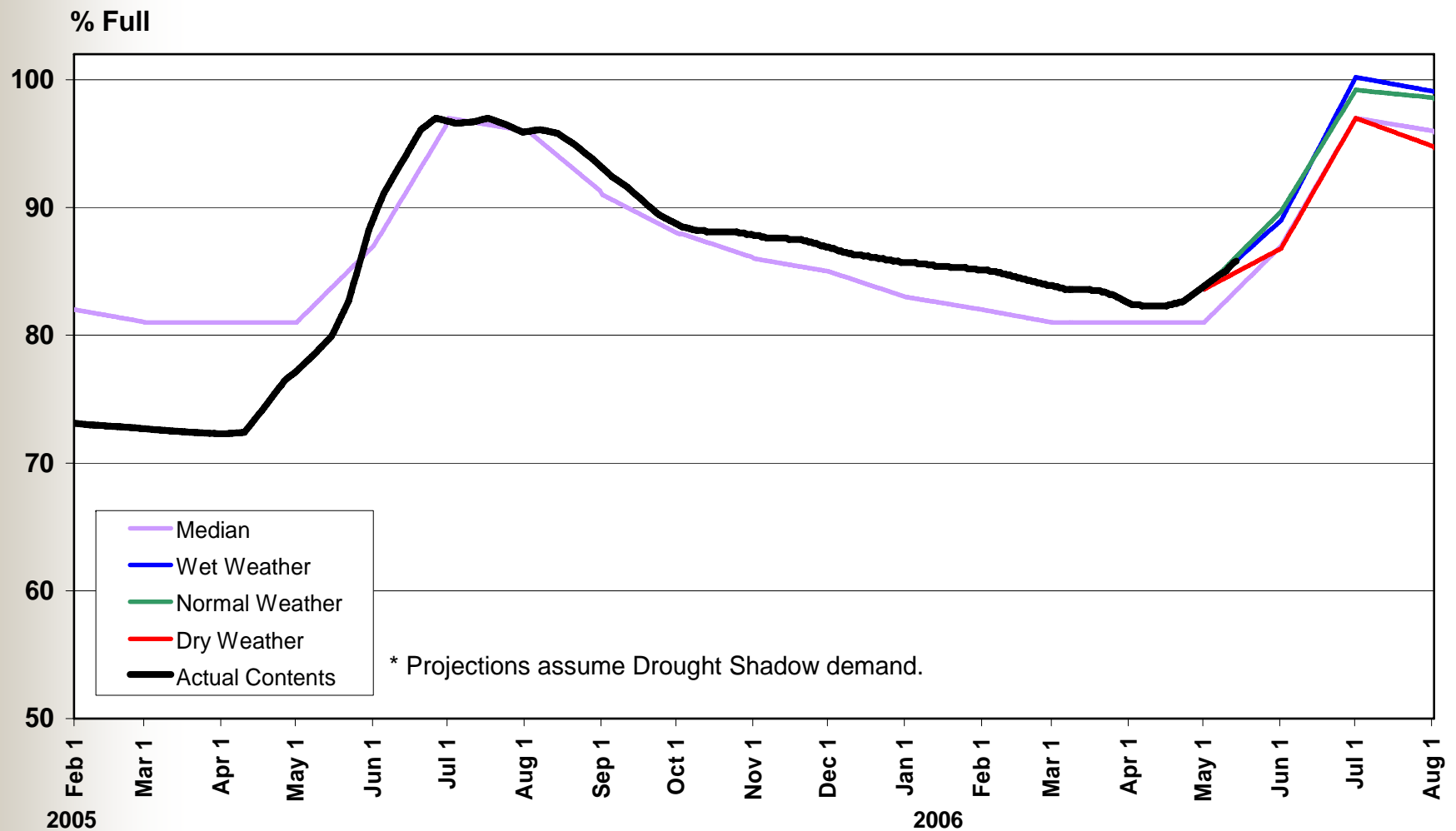
STREAM OR
RIVER



TUNNEL, CANAL
OR DITCH



Denver Water Total Reservoir Storage (Historical and Projected)



*Note: There is about a 10% chance that actual stream flow will be less than that assumed for the "dry" scenario and about a 10% chance that actual streamflow will be greater than that assumed for the "wet" scenario.

* Forecast Date is May 9, 2006.

The Real Cost of Water

- Water - \$1.64/1000 gallons to \$4.00/1000 gallons
- Sewer - \$1.95/1000 gallons
- Sewer Surcharge
- Energy Costs – Pumping & Heating
- Chemical Costs
- Drought Surcharge



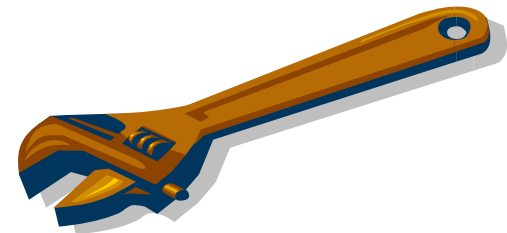
Audits

- Identify and quantify all water using equipment and processes
- Tools
- Water Balance
- Key Target Areas
 - ✓ Cooling & Heating
 - ✓ Process & Equipment Use
 - ✓ Sanitary, Kitchen
 - ✓ Domestic
 - ✓ Landscape Irrigation
 - ✓ Leaks



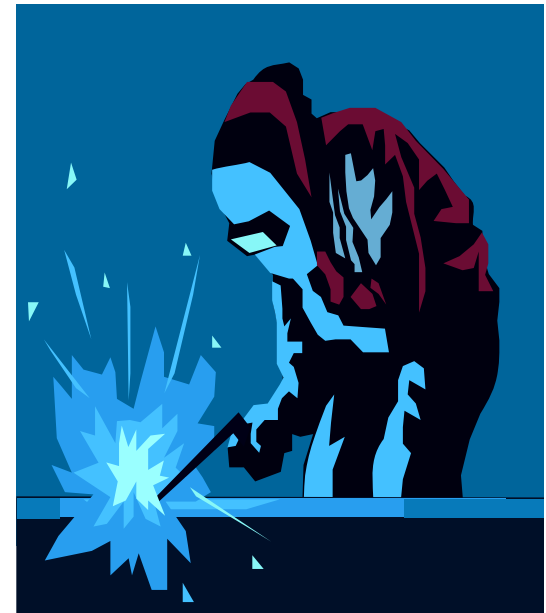
Tools of the Trade

- Domestic Plumbing Codes – 5.0gpf/1982 to 3.5gpf/1992 to 1.6gpf
- Laundry – 3gal/pound
- Landscape – 18gal/ft² (irrigation credit)
- Cooling 3gpm/100ton (evaporation credit)
- Food Service – 3 gal/meal (product credit)



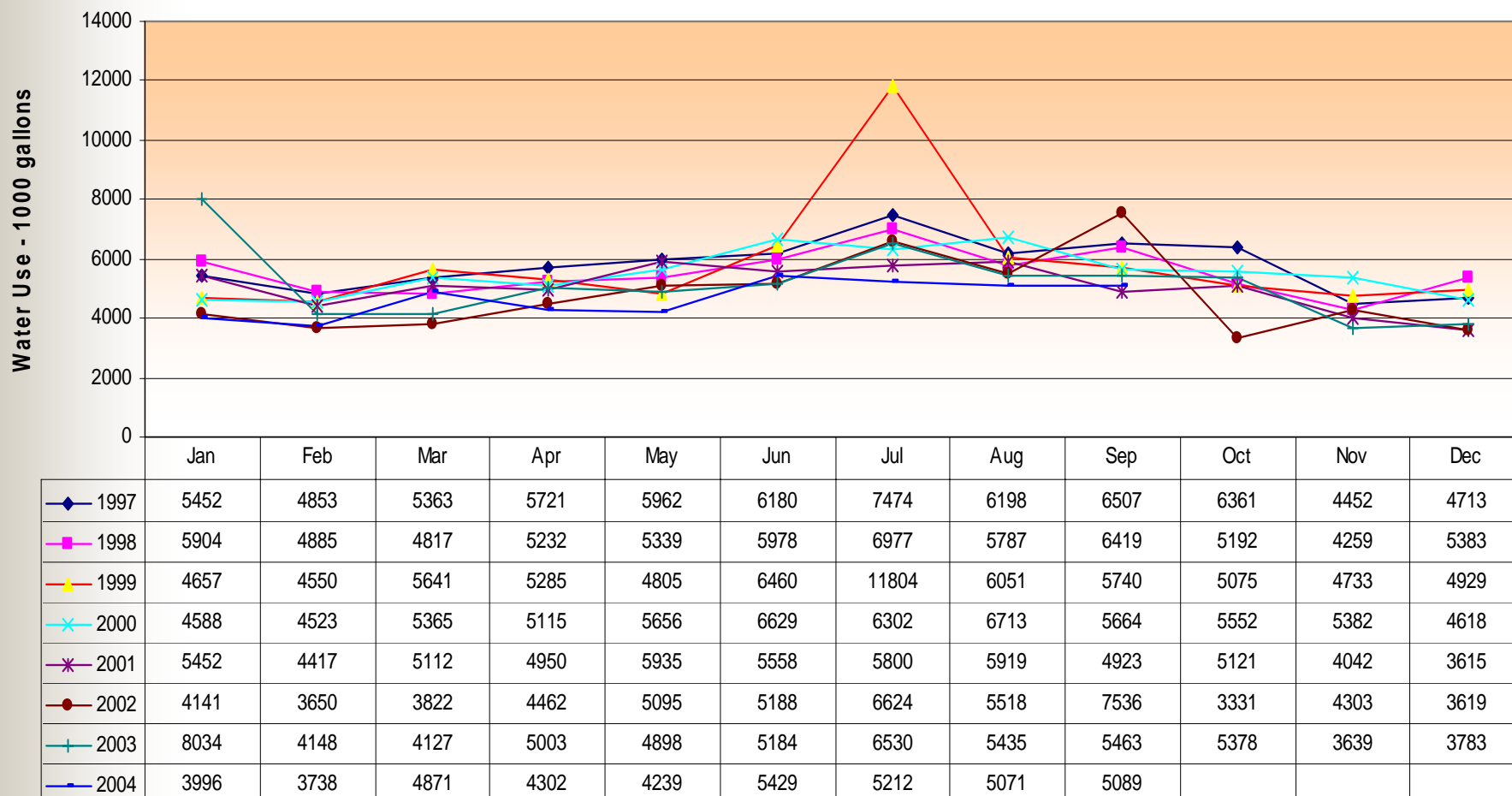
Tools

- Flow bag
- Ultrasonic flow meter
- Data logger
- Conductivity meter
- Thermometer
- Leak detection tablet
- Sub meter
- Pressure gauge

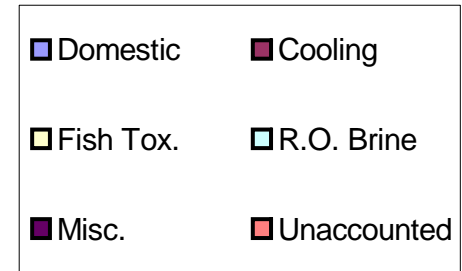
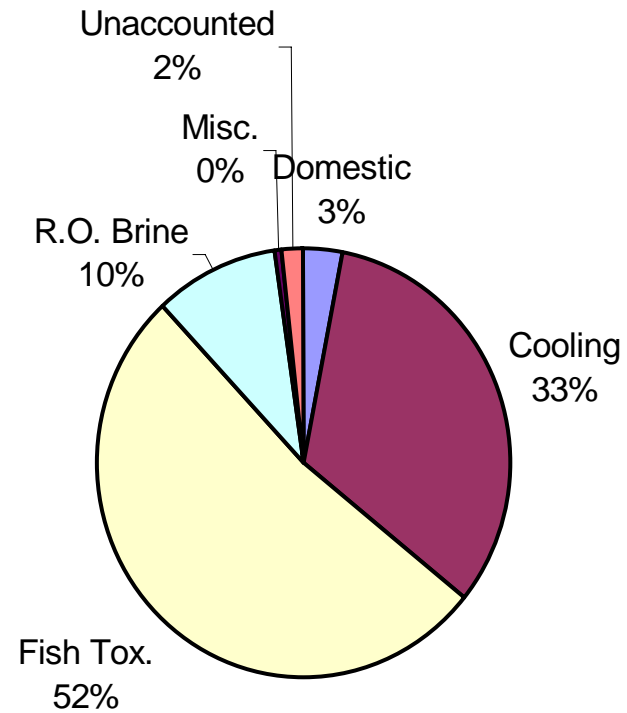


Water Use History

Exempla St. Joseph Hospital



Water Balance - EPA Lab





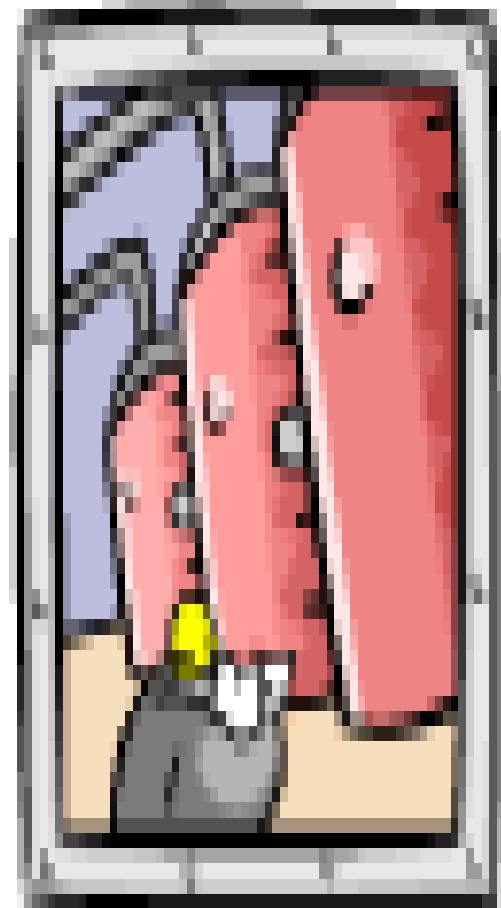



Commercial/Industrial Performance Contracting Program

- 300,000 gallons minimum
- Extra Incentive
- Maximum of \$40,000
- \$4,500 Acre-foot

Typical Scenario

- Contact Denver Water
- Site Visit
- Quantification
- Agreement
- Installation
- Monitored for 1-year
- Check is written



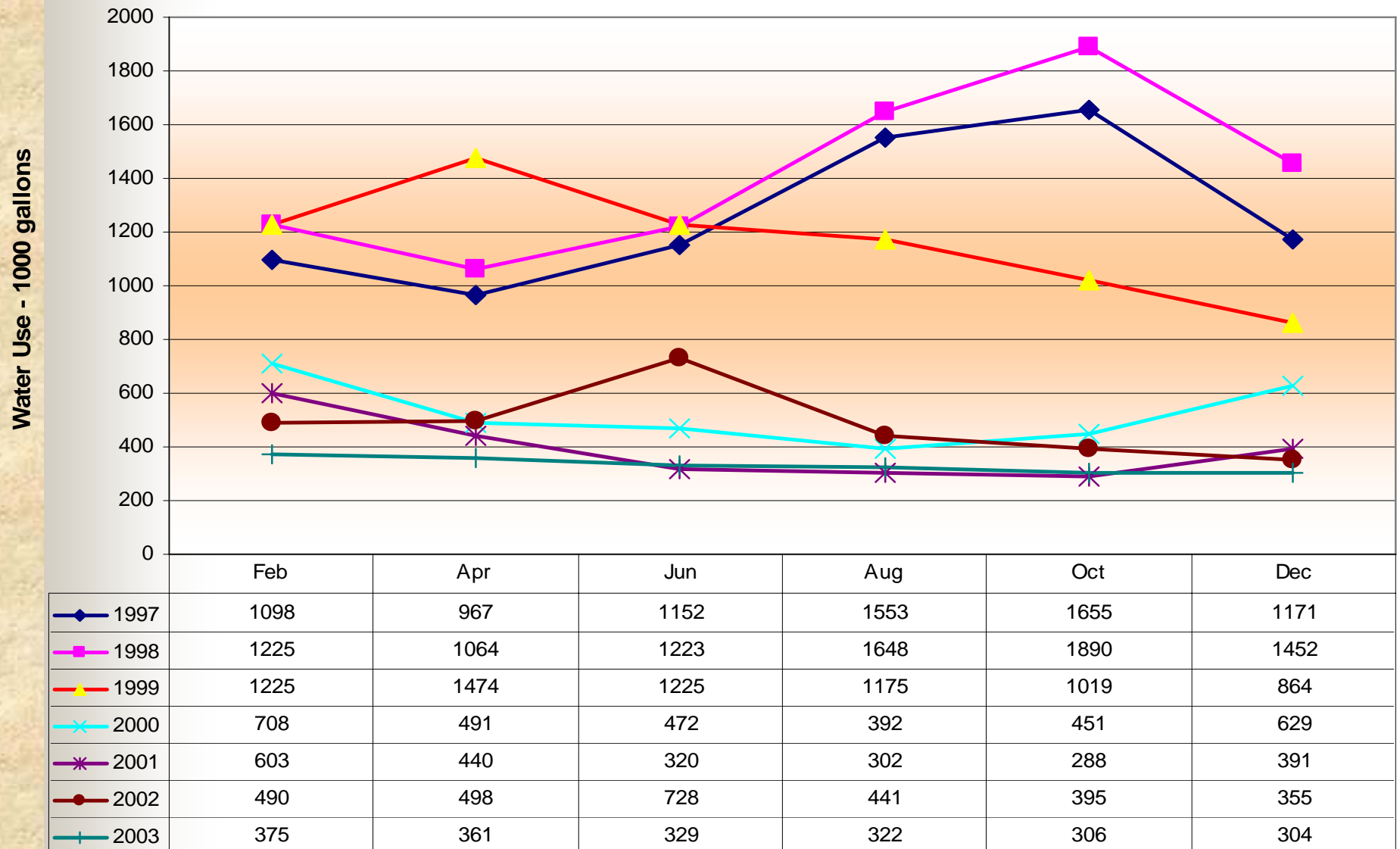
- 
- Laundry
 - Closed-Loop Applications
 - Metal Finishing
 - Cooling Tower
 - Hospitals
 - Air-Cooled Equipment
 - Cleaning
 - Water Treatment Systems - Recycling



Colorado Business Bank Building

- Tied into District Chilled Water
- Closed-loop several once-through cooling flows from Broker Restaurant

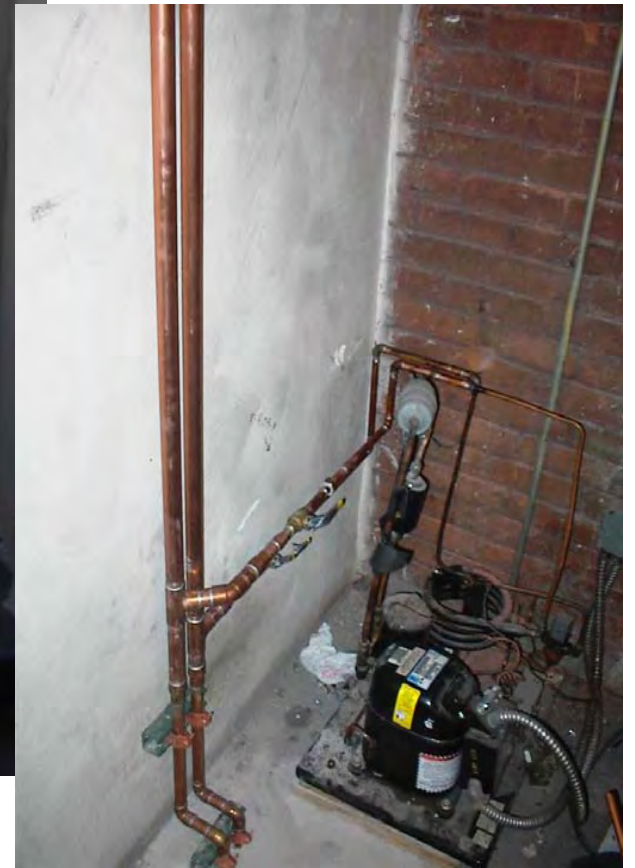
Colorado Business Bank Building



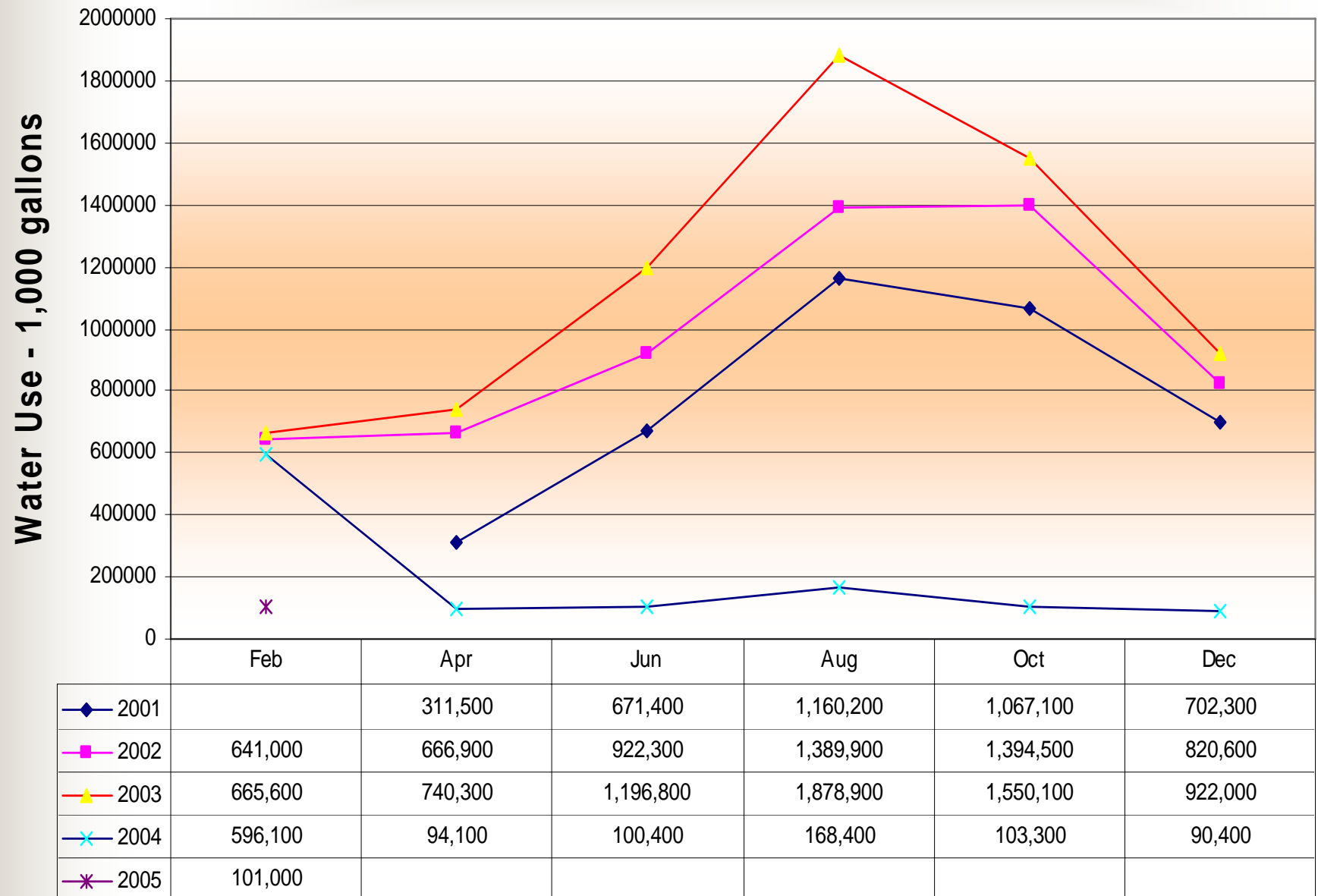


East Side Kosher Deli

- Eight single-pass cooling compressors – tied into a closed-loop unit
- Walk-in coolers, walk-in freezers, ice-makers, reach-in coolers



East Side Kosher Deli





Cooling Tower Program

- 25% of Commercial/Industrial Water Use
- 2000 Cooling Towers in Denver Water Service Area
- Feed & Bleed Systems



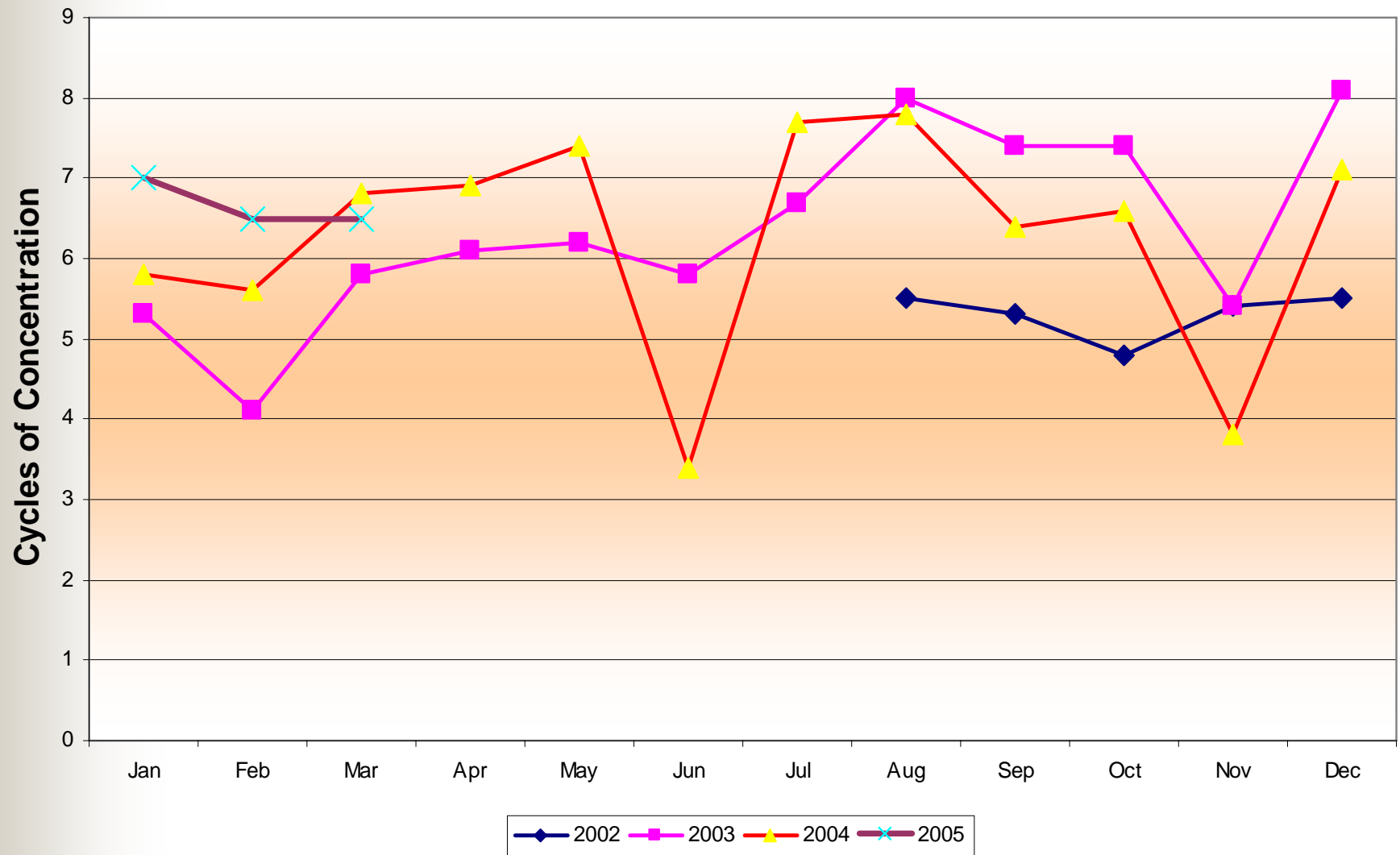




Cooling System Audits

- Operated 3 – 4 Cycles of Concentration
- Increase Cycles
- Monitoring Devices – Conductivity
- Regular Testing
- Flow Meters – Evaporation Credits
- Cooling Tower Pilot Program

Denver Water Administration Bldg. Cooling Tower





Cooling Tower Conductivity Control Rebate

- \$500 for Cooling Tower Conductivity Control Systems (new or replacement)
- \$50 each for CT Make-up & Bleed Meters

With sub-metering of make-up and bleed, you may be eligible for evaporation credits from your wastewater utility



Cooling Tower Pilot Program

- Wastewater Management & Denver Water
- Enter Cooling Tower make-up and bleed meter readings electronically
- Evaporation Credits on sewer bill
- Efficiency check



Single-Pass Cooling

- Ice Machines
- Freezers/Coolers
- Air Compressors
- Air Conditioning Units
- Hydraulic Equipment Cooling
- Vacuum Pumps
- X-ray Processing Units
- CAT Scanners

Other Options

- Air-cooled Equipment
- Closed-loop systems
- Recycle – i.e. cooling tower make-up
- Add temperature control valves





Replacement of Water-Cooled Equipment

- \$450 per piece of equipment replaced with air-cooled equipment



Other Incentives and Rebates

- Commercial High-Efficiency Toilet Rebate Program - \$125 per toilet for dual-flush and 1.1 gpf units
- Boilerless Steamer Replacement Rebate - \$350 when replacing atmospheric steamers
- MF Sub-Metering Rebate Program - \$40 per sub-meter
- Coin-Operated Laundry Equipment Rebate - \$150 for replacing top-load with approved front-load machines
- Certified Car Wash Equipment – Weep management system and nozzle rebates available for certified car wash locations



What Can You Do?

- Know Where Your Water Goes – Do the Obvious First
- Do a Water Audit
- Identify Opportunities
- Plan & Implement Measures
- Take Advantage of Rebates and Incentives



What Your Water Utility Can Do

- Consumption History
- Billing Analysis
- Audits
- Rebates & Incentives

Looking Ahead

- Costs
- Drought
- Looking for New Ideas





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